Iowa Crash Analysis Tools

GIS-ALAS
(Safety Data Analysis using a Geographic Information System)

For more information:

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Background

GIS-ALAS began through a series of local safety focus group meetings intended to provide local input into the selection of research and studies. During these meetings, development of a GIS-based ALAS received strong support. Thus, a three-year development project was launched at the Center for Transportation Research and Education (CTRE) at Iowa State University.

After evaluation of several GIS platforms, ArcView GIS was selected. Michael Pawlovich, a graduate student with CTRE at the time, created the first GIS-ALAS using Avenue scripts, with the entire Iowa ten-year crash database available.

First Version Beta Tested

The beta-version was tested during the summer of 1999 by approximately 30 agencies statewide. On completion of the test exercises, participants were free to keep GIS-ALAS and the licensed copy of ArcView (provided free to them if they did not already have it). State and federal safety project funds covered all costs to the beta testers.

The most significant fact gained from the development process and beta test effort was how serious an obstacle the GIS learning curve posed to the statewide pool of PC-ALAS users. The very group who requested the software could not find the time to learn how to use it. Within the DOT Traffic and Safety Office (TAS), things weren't much different. The beta test did not really get rolling until a step-by-step "how to beta test this tool" notebook was created and a consulting trainer hired to maintain contact with agency personnel.

The programmer required user feedback and input to continue developing the software, but that information was very slow and difficult to obtain from any of the users. This was particularly frustrating given the effort that had gone into user education at every stage of the project, including: project progress presentations at key meetings and conferences and some daylong events scheduled specifically for GIS-ALAS that were well attended and well received. GIS-ALAS was being demonstrated frequently, yet the problem persisted.

Research Tool

GIS-ALAS was quickly embraced by university researchers and used for specialized studies. One study involved deer-vehicle collisions and collaboration with the Department of Natural Resources. We realized we could commission even more studies at the university level on complex and significant safety problems to reap immediate benefits from development costs. Plus, the studies could showcase the value of the tool.

CTRE Traffic Safety Data Service

It became clear that most ALAS users needed a different kind of resource—a way of getting their needs met without having to develop the technical capability required. State agencies needed GIS-ALAS output displayed for both technical reports and public education purposes. Local agencies required standard reports about their jurisdictions while they were learning the new tools and acquiring new hardware and software. Using TEA-21 Section 411 funding for the improvement of state traffic records systems, a data service was started at CTRE.

This service has grown slowly but surely and is popular with all its customers. Not intended to do everything for everyone, it helps users by extending their capabilities. As users become more technologically savvy, they will hopefully be doing more hands-on analysis. This analysis may lead them towards more advanced concepts, requiring further outside technical assistance.

Spin-off Applications Take Off

GIS-ALAS is a full-fledged analytical tool capable of integrating crash data with other data in a GIS environment. While GIS-ALAS was being developed, the Iowa DOT had also contracted with CTRE to bring together many forms of transportation data, including crash data, into a data warehouse. This project, the Comprehensive Transportation Analysis System (CTAMS), is primarily for analysts not working directly in safety and provides access to crash data and allows integration with their primary data sources. Not designed specifically for safety analysis, CTAMS is not a substitute for GIS-ALAS.

Location Tool for Data Capture

Another development that grew from GIS-ALAS efforts was the Location Tool for locating a crash by coordinates and route, using a smart map. Already implemented, all crashes occurring in 2000 will have coordinates instead of link-node location information. This data will need no location conversion to enable use with GIS-ALAS, as had previous data years. This makes software tools still using the link-node system obsolete.

Emergency Response Information System (ERIS)

Another spin-off is a system designed for the planning needs of the emergency response community and supporting agencies. Currently, no central repository in Iowa for fire and rescue response areas and boundaries exists. Creating data and map layers for this information will allow emergency response information involving boundaries, personnel, equipment, training, etc. to be inter-related with the road system and with other data such as injury motor vehicle crash locations and frequencies. It will also serve as a communications tool, such as when road reconstruction will affect how these local services function. Transportation officials can check ERIS to contact the appropriate volunteer services early in the planning process.

GIS-ALAS: the next version

The next release of GIS-ALAS is scheduled for mid 2001. This version will be able to read the TraCS local database, which differs in format from the state file. Many improvements and enhancements are also in the works, including a new user guide.